

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A flat low friction cord comprising a flexible and substantially flat core enshrouded by a knitted cover; the cover being knitted around the core from yarns, wherein the knitted yarns at the cord surface define a low friction and abrasion resistant sliding surface.
2. The cord according to claim 1 wherein the yarns at the cord surface are oriented more in a longitudinal direction of the cord than in a transverse direction.
3. The cord according to claim 1 wherein the yarns at the cord surface extend in a continuous zig-zag pattern along a length of the cord.
4. The cord according to claim 1 wherein at least some of the yarns are pre-twisted in one direction.
5. The cord according to claim 1 wherein the yarn has a denier of between 100 and 10,000.
6. The cord according to claim 5 wherein the yarn has a denier of 1500.
7. The cord according to claim 1 wherein the knitted cover is sufficiently dense to substantially cover the flat core.
8. The cord according to claim 1 wherein the yarn fibres are preferably a synthetic fibre.
9. The cord according to claim 8 wherein the yarn is a polyester, polypropylene or nylon fibre.
10. The cord according to claim 1 wherein the cord is a foamed polymer.

11. The cord according to claim 10 wherein the material of the core is polyvinyl chloride, polyester, polyethylene or polypropylene.

5 12. The cord according to claim 11 wherein the core is extruded foamed polyvinyl chloride.

13. The cord according to claim 1 wherein the core is coated with adhesive underneath the knitted cover.

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14. The cord according to claim 1 wherein the cover is heat set onto the core.

15. A method of producing a flat low friction cord including:

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moving a flexible and substantially flat core through an aperture in a knitting head, wherein needles threaded with yarns are provided on the knitting head around the aperture; and

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knitting the yarns around the moving core by moving the knitting head and needles in a knitting pattern and forming a knitted cover enshrouding the core.

16. The method according to claim 15 including knitting the yarns such that they are oriented more in a longitudinal direction of the cord than a transverse direction.

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17. The method according to claim 15 including tensioning the yarn to a high tension before knitting.

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18. The method according to claim 15 including pre-twisting at least some of the yarn fibres in a first direction at low turns per metre.

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19. The method according to claim 18 whereby the yarns are twisted at 80 turns per metre.

20. The method according to claim 15 wherein the knitting pattern includes skipping 0, 1, 2, 3 or 4 needles.

21. The method according to claim 15 including using
5 a knitting head having 14 needles and knitting a knitting pattern without skipping needles.

22. The method according to claim 15 including
knitting the yarns by twisting the head, lifting the
10 knitting head and extending the needles above the knitting head thereby defining the pitch.

23. The method according to claim 22 including
twisting the knitting head through between 90° and 180°.

15 24. The method according to claim 23 including
twisting the knitting head through at 135°.

25. The method according to claim 22 including
20 twisting the knitting head at 225 cycles per minute.

26. The method according to claim 22 including
lifting the knitting head between 15-30mm.

25 27. The method according to claim 26 including
lifting the knitting head 28mm.

28. The method according to claim 22 including
setting the pitch between 1-5mm.

30 29. The method according to claim 28 including
setting the pitch at 2.7mm.

30. The method according to claim 15 including moving
35 the flat core down through the knitting head at
approximately 150 metres per hour.

31. The method according to claim 15 including covering the flat low friction cord in adhesive.

32. The method according to claim 15 including heat
5 setting the flat low friction cord.

33. An apparatus for producing flat low friction cord comprising:

a cylindrical knitting head mounted on a base and
10 having a central longitudinal aperture which is adapted to receive a flexible and substantially flat cord core moving therethrough, the knitting head being movable relative to the base;

needles mounted on the knitting head around the
15 aperture and individually moveable from a retracted position on the knitting head to an extended position;

guiding means adapted to guide yarns from a yarn supply to the needles through which the yarns are threaded;

feeding means to move the core through the
20 aperture; and

driving means for separately moving the knitting head and the needles in a knitting pattern so as to knit the yarns into a cover enshrouding the substantially flat core.

25 34. The apparatus according to claim 33 wherein the knitting head is twistable around the core and reciprocally movable parallel to the core defining head lift.

30 35. The apparatus according to claim 33 wherein the knitting head is twistable through between 90° and 180°.

36. The apparatus according to claim 35 wherein the knitting head is twistable through 135°.

35 37. The apparatus according to claim 34 wherein the head is twistable at 225 cycles per minute.

38. The apparatus according to claim 34 wherein the head lift is 15mm to 30mm.

39. The apparatus according to claim 38 wherein the head lift is 28mm.

40. The apparatus according to claim 33 wherein the needles lift above the knitting head at a pitch of 1-5mm.

41. The apparatus according to claim 40 wherein the pitch is 2.7mm.

42. The apparatus according to claim 33 wherein the number of needles provided around the aperture is a multiple of 2 between 4 to 32 needles.

43. The apparatus according to claim 42 wherein the number of needles is 14.

44. The apparatus according to claim 33 wherein tensioning means is provided to tension the yarns during knitting.

45. The apparatus according to claim 33 wherein the guiding means is a circular yarn guide provided above the knitting head and having a diameter larger than the knitting head to guide yarns from a yarn source through the yarn guide downwardly and inwardly toward the needles on the knitting head.

46. The apparatus according to claim 33 wherein the feeding means comprises haul-off rollers located below the knitting head to move the core downwardly through the aperture.

47. A knitting head for knitting a yarn fibre cover onto a substantially flat core to produce a flat low

friction cord, the knitting head being adapted to be moveably mounted on a knitting apparatus and comprising a cylindrical body having a central longitudinal aperture for receiving the core therethrough;

5 needles spaced around an upper end of the cylindrical body and individually moveable from a retracted position to an extended position, wherein the needles are adapted to be threaded with yarns;

10 whereby the knitting head is adapted to move in synchronisation with the needles so as to knit the cover around and onto the core.

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